INSTALLATION INSTRUCTIONS

The TYMETAL TCRB-4M
Manually Operated
K4 Crash Rated Drop Arm

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CRASH RATED DROP ARM
INSTALLATION INSTRUCTIONS
(TO BE USED IN CONJUNCTION WITH SHOP DRAWINGS)

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1. Warnings

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**DANGER**

**CRUSH HAZARD!**

UNBALANCED CRASH ARM CAN CAUSE SERIOUS INJURY OR DEATH.

Do not attempt operation of arm until counterweight has been assembled according to weight plate diagram.

**CAUTION**

**RISK OF INJURY!**

FREE FALLING ARM CAN CAUSE SERIOUS INJURY AND/OR DAMAGE TO EQUIPMENT.

Do not allow crash beam to move unattended. The operator should maintain physical contact with the handle throughout the beam’s entire range of motion.
2. Introduction

This crash product is not intended for use as an unsupervised traffic control device!

The Tymetal Crash Rated Beam (TCRB) is designed to protect facilities from unwanted vehicle intrusions and as such, has an inherently higher risk of bodily injury associated with its use when compared to traffic control arms. The TCRB is specifically designed to stop a vehicle and can, during an impact with a vehicle, produce injury or death to the occupants of the impacting vehicle. The placement and operation of the TCRB barrier should be carefully considered and reviewed by a qualified traffic or safety engineer to reduce or eliminate the possible accidental injury from an unwanted impact. Provisions of the layout should always include a separate safe passage for pedestrians away from the vehicle barrier. Drivers should be advised of the presence and operation of the TCRB arm and the operation of the arm should be monitored while in use.

The TCRB includes the latest technology to provide a superior operating device for a long, problem free life. The complete product is defined by two major components: the stanchions and the arm. The stanchions are the steel weldments placed in the ground which hold the arm in place. The arm, designed using the latest in material science, will provide a positive containment barrier while reducing the operating weight. The reduced weight of the arm is a benefit in designing an efficient operating system. The counter-balanced arm is manually operated and easily raised and lowered by security personnel.

Refer to the approved submittal drawings for all required layout dimensions. Locate the area where the installation is to be performed and verify all subterranean obstructions are identified and cleared. Ensure there is adequate space for the staging of the arm and accessories. Verify that there are no overhead obstructions that would interfere with the gate operation.

3. Required Equipment and Materials

✓ Laser Level
✓ Digital Level
✓ Transit
✓ A Backhoe or Similar Excavation Apparatus
✓ A Lifting Apparatus (Crane, Forklift, etc.) (minimum 10,000 lb capacity)
✓ Torque Wrench (minimum 250 ft-lbs)
✓ Basic Hand Tools
4. Foundation Installation

**NOTICE: SOILS DISCLAIMER**

Soils for all concrete footings, vaults, and foundations for active, anti-ram vehicle barriers, in general, must have a minimum soil bearing pressure of 65 kPa (1350 psf) for all seismic zones unless more stringent conditions are identified. Where organic soils are present, the maximum allowable bearing capacity shall not exceed 48 kPa (1000 psf) and where the in-situ soils consist of stiff weathered clay, the maximum allowable bearing capacity shall not exceed 95 kPa (1980 psf) for all seismic zones.

When existing conditions indicate that the soil bearing capacity is less than 45 kPa (940 psf), the foundations shall be designed by a registered structural engineer. Backfill shall be low-cohesive, well-graded crushed stone or broken gravel at least the depth of the foundation and extending around the structure 1.5 times the embedment depth, or at least 2.0 ft. Backfill shall be compacted to a density of not less than 90 percent maximum dry density.

TYMETAL recommends consulting a civil engineer.

Use caution when installing this product. If you are unfamiliar with this type of construction, find a trained professional to assist. Use best construction practices when handling and placing imbeds, the weldments are heavy and can cause serious harm or death if mishandled. Proper tools are necessary for a successful installation.

4.1. Locate the area in which to place the crash beam system. Be sure it is clear of all below grade interferences such as utilities before starting excavation.

4.2. Excavate the foundation area as shown on the installation drawings. The depth of the excavation will depend on many factors including but not limited to the use of a sub-base for placing the stanchion channels, masonry walls, frost line, and soil conditions. Consult a local Civil Engineer for any foundation design in addition to the tested stanchion footings for the K4 Crash Beam. Refer to site specific submittal drawings for the project, allowing for any additional required conduits, embedment’s, etc. not shown on the submittal drawings. Refer to site specific drawings for foundation size required.
4.3. A sub pad, which is deeper than the foundation, is required to set the stanchions on. Pour this sub pad prior to installing stanchions.

*Figure 4.3.1: Stanchion Placed on the Sub Pad*
5. Stanchion Installation

5.1. Inventory Stanchions. Each TCRB-4 system ships with two stanchions; one (1) pivot stanchion and one (1) receiver stanchion. Each of the stanchions ship with hardware for leveling the base.

![TCRB Stanchion Comparison](image)

5.2. Prepare the stanchions for installation. Assemble stanchion bases to stanchions as shown in Figure 5.2.1 (receiver stanchion shown, pivot stanchion assembly is the same). Install the four TYMETAL supplied 3/4” x 8” leveling bolts per stanchion base through the welded on nuts. Using the 3/4” x 10” hex head bolts, washers, and nuts, secure the stanchion bases to stanchions.

![TCRB-4 Stanchion Base Assembly](image)
5.3. Tie together one #4 rebar mat in trench prior to installing stanchion. See submittal drawings for rebar mat details.

![Figure 5.3.1: Lower Rebar Mat Being Assembled](image)

5.4. Locate and place the assembled stanchion. Use leveling bolts to align and plumb the stanchion. It is CRITICAL to place and anchor the stanchions in line, plumb and level with each other. The use of strings and a transit is necessary to ensure the gate arm will be level and follow a straight arc as it opens and closed along its path. Stanchions must be level in all directions and placed at the specified height above grade for proper gate function.

![Figure 5.4.1: Stanchion Centering Layout Detail](image)
5.5. Assemble in place and tie completely one #4 rebar mat on top of stanchion base (see submittal drawings for details).

**NOTICE**

Clear opening is measured from 8” tube face to 8” tube face. Measurements should be verified prior to pouring concrete.
5.6. Refer to the submittal drawings and ensure the stanchions are at the correct height above grade. If you are not familiar with proper techniques for verifying the condition and location of the stanchions, stop and get assistance before pouring the concrete. It is not possible to make adjustments to the stanchions once the concrete footings have been poured.

**NOTICE**

Other components that may not be shown on the drawings that are necessary for site completion should be placed before pouring the concrete. Other devices, site power, water/sewer lines and other services may not be shown on the shop drawings and are the responsibility of the installer.

5.7. Once all the stanchions have been checked for elevation, and are plumb and level, pour the concrete (3000psi min.) as shown on the drawings. Monitor the pour at all times to assure the stanchions remain in line, plumb and level. Compact surrounding soil. See Soils Disclaimer in Section 4.

[Diagram of finished grade tolerances]

**Figure 5.7.1: Finished Grade Tolerances.**

(Consult Site Specific Submittal Drawings for Additional Installation Dimensions)

[Diagram of pivot stanchion grade adjustment]

**Figure 5.7.2: Pivot Stanchion Grade Adjustment (See Notice Below)**

**NOTICE**

If grade is high at pivot stanchion adjust concrete so that there is no interference with pedal latch or counterweights. Refer to Section 8 of this manual.
6. Arm Installation

6.1. Before installing the arm, temporarily add the bearing bolts, flat washer, and eccentric adjuster to both stanchion side plates. This will not be possible once the arm is in place. While supported by a lifting device, carefully guide the arm into the pivoting stanchion, aligning the pivot pin holes with the cutout in each side plate. Insert the pivot pin through the flange bearings and arm.

![Image](Figure 6.1.1: Pivot Stanchion Flange Bearing Assembly (Right). Beam Being Lowered Into Place Using Appropriate Sling Methods (Left)).

6.2. Assemble the flange bearings to the pivot stanchion as depicted above. At this point, the bolts holding the bearing housings to the stanchion should be hand tight.

6.3. Install the two piece locking collars on the pivot pin such that they lie inside of the side plates of the stanchion and flush to the arm. Tighten the collars with a hex key to keep the arm from moving horizontally.

![Image](Figure 6.3.1: Pivot End View of Beam Showing Locking Collars)
6.4. Check the alignment of the arm in the receiver. If necessary, use the TYMETAL supplied eccentric adjuster wrench to rotate the eccentric adjusters (see below). Rotate the adjusters until the receiver end of the beam is roughly centered within the receiver stanchion.

![Diagram showing alignment of arm in receiver]

Figure 6.4.1: Using the Eccentric Adjuster Wrench to Locate Receiver End of Beam

6.5. Torque the nuts on the bearing flange to 200 ft-lbs. The arm should be centered between the two stanchions. Do not twist the beam to align it in the receiver stanchion.

6.6. Tighten set screws on bearings to hold the shaft in place once the beam is in place and aligned.
6.7. Install Lockout Plate on the top of the Pivot Stanchion.
7. Manual Counterweight Installation

7.1. Lock the arm in a closed position using the locking pin on the receiver stanchion. The arm must be fully closed and locked prior to installing weights. Once the arm is centered and locked, install the threaded rods about the pivot end of the beam. Ensure the rods are centered.

![Diagram of Generic TCRB4-M Assembly]

*Figure 7.1.1: Generic TCRB4-M Assembly*

(Parts received may vary from what is shown. See provided weight plate diagram and submittal drawings for specific weight layouts and additional parts that may be required for installation)

7.2. Weight plate diagrams are supplied in the hardware box. The crash beam has been pre-assembled and balanced per the supplied diagram before shipment.

7.3. It is CRITICAL that weights are installed on the arm per the diagrams supplied.

7.4. Use a lifting device to install weights. Some beams may also require dowel pins be placed in center weight plates- refer to the provided weight plate diagram. Install centermost weights...
and dowel pins as required. Install weights on the beam alternating sides (retaining with a nut before proceeding) until all weights are accounted for.

7.5. When all weights have been installed, secure them with the appropriate washers and nuts, tighten to the proper torque rating for the fastener. Verify layout of weights matches that shown in the supplied weight plate diagram. To ensure beam operation it is critical that the weights are installed in the proper order.

8. Final Assembly

8.1. Using (2) 3/8”-16 x 1 1/2” bolts and provided washers, bolt the pedal latch assembly to the tapped holes in the stanchion.

8.2. Attach TCRB handle and shock absorber as detailed in Figure 8.2.1. All hardware can be found in the TYMETAL supplied hardware kit.
Figure 8.2.1: Handle and Shock Absorber Assembly

8.3. Remove the locking pin from the receiver stanchion and verify that, in the open position, the arm latches and releases using the pedal latch. The pedal may be adjusted slightly to ensure latch is operable.

8.4. Adjust the shock absorber as needed. The arm should open and close using the handle mounted on the weight plates. Slowly operate arm up and down. Do not allow arm to move unattended.

⚠️ CAUTION ⚠️

RISK OF INJURY!

FREE FALLING ARM CAN CAUSE SERIOUS INJURY AND/OR DAMAGE TO EQUIPMENT.

Do not allow crash beam to move unattended. The operator should maintain physical contact with the handle throughout the beam’s entire range of motion.
9. Operating Instructions

9.1. For typical operation, begin by removing the padlock from the locking pin and removing the locking pin.

![Figure 9.1.1: Lock Pin Located on Receiver Stanchion](image)

9.2. To raise beam, slowly push downward on the handle that is mounted to the counterbalance weights. The beam should raise and lower with ease.

![Figure 9.2.1: Manual Operation of Beam at Pivot Stanchion](image)

9.3. When the beam is in the fully open position, the shock absorber mount will latch onto the pedal latch. You may need to lightly step on the pedal to engage the latch. The beam should now be latched in the open position. If desired, the locking pin can be slid through the pivot stanchion locking tabs to lock the beam in the open position.
9.4. To release the beam from the open position, lightly step on the pedal. Using the handle lower the beam slowly.

![Figure 9.4.1: Lowering the Crash Beam](image)

9.5. Secure the beam in the closed position by replacing the locking pin and locking it with a padlock (reference Figure 9.1.1).
10. Maintenance

Each crash beam is built with the highest quality parts for a long service life. The unit should be inspected and serviced on a regular schedule based on usage and age. More frequent service intervals may be required based on usage and environmental conditions. Monitor your unit closely for the first week to develop a base line and then throughout the first year to establish a maintenance schedule for your specific location in order to ensure years of safe use. At a minimum, all aspects of the barrier should be visually inspected within the first week to verify everything remains tight and no misaligned parts exist.

The bearings and connecting bolts need to be serviced at 3 month intervals or more frequently with heavy use.

Critical items that need inspection and maintenance or replacement as required for reliable operation are listed below. It is imperative that the following checks be made within the first 3 months of operation.

These items include:

✓ Connection bolts in the counterweight assembly and steel beam insert
✓ Axle shaft location.
✓ Axle shaft bearings.
✓ Bearing mounting bolts on the stanchion.

The following is a guide for the inspection. Typically the following checks should take 1-2 hours.

TYMETAL recommends the following:

10.1. Drop Arm
✓ Inspect axle shafts and locking collars every 3 months.
✓ Check counterbalance weight bolts every 3 months.
✓ Grease all fittings with GL-2 grease (Annually).
✓ The axle shaft location is critical to assure the beam lands in the receiver properly. This location is controlled by the flange bearings. Confirm the bolts are tight and the bearing has not moved. If movement is detected by the evidence of a misaligned arm or paint damage, check for loose bearing bolts and tighten as needed.
✓ The bearings should be inspected and greased as needed. If noise or rough operation is noticed, replace the bearing.
✓ Inspect all bolts. The bearing mounting bolts, limit switch mounting bolts and connection bolts should be replaced if any indication of wear or structural degradation is visually apparent.
This is a guide and is not totally comprehensive of the maintenance of the crash beam. Visual inspections should be conducted daily by a person familiar with the system. If changes in the operation or unusual noises are discovered, a complete inspection is required.

11. Technical Support

11.1. Requesting Service:

11.1.1. During the normal course of business, questions may arise from field personnel with regard to the crash rated drop arm system. When general questions arise, call 1-800-328-4283. Business hours are 7:00am to 5:00pm EST, Monday through Friday.

11.2. Ordering Spare or Replacement Parts:

11.2.1. If the need arises TYMETAL has the capability of delivering spare parts via next day air in the event of an emergency, minimizing down time and inconvenience to the facility. To order spare or replacement parts, call 1-800-328-4283. Business hours are 7:00am to 5:00pm EST, Monday through Friday.